

CLAIMS

1. A non-woven fabric of a three dimensional structure comprising fibers, which is bonded substantially at portions of contact between each of the fibers and the fibers are arranged along random directions in at least two surfaces of the three dimensional structure.

2. A non-woven fabric of a three dimensional structure comprising at least two types of fibers in which one of constituent fibers contains an ingredient having a melting point lower than that of other fibers, which is substantially bonded at portions of contact between each of the fibers and in which the fibers are arranged along random directions in at least two surfaces of the three dimensional structure.

3. A non-woven fabric as defined in claim 1 or 2, wherein the constituent fibers comprise core-sheath type heat fusible fibers and fibers of 1.5 denier or less.

4. A non-woven fabric produced by preliminarily opening fibers by a preliminary opening machine, then accumulating fibers so as to automatically stack them vertically to a portion of a low stacking level by using an air stream and then substantially bonding portions of contact between each of the fibers.

5. A method of producing a non-woven fabric, which comprises preliminarily opening fibers by a preliminary opening machine, then accumulating fibers so as to automatically stack them

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vertically to a portion of a low stacking level by using an air stream and then substantially bonding portions of contact between each of the fibers.

6. An apparatus for producing a non-woven fabric comprising a mechanism of preliminarily opening fibers by a preliminary opening machine, a mechanism of stacking fibers so as to automatically stack them vertically to a portion of a low stacking level by using an air stream and then substantially bonding portions of contact between each of fibers.

7. A cushion material using a three dimensional structure of a non-woven fabric constituted with fibers which are substantially bonded at portions of contact between each of the fibers of the three dimensional structure and in which the fibers constituting the three dimensional structure contain fibers with a fiber denier of 100 denier or more, and the fibers are arranged along random directions in at least two surfaces of the three dimensional structure.

8. A filter using a three dimensional structure of a non-woven fabric constituted with fibers which is substantially bonded at portions of contact between each of the fibers of the three dimensional structure and in which the fibers constituting the three dimensional structure contain fibers with a fiber denier of 1000 denier or more, and the fibers are arranged along random directions in at least two surfaces of the three dimensional structure.

9. A non-woven fabric structure constituted by bonding plural fiber lumps each comprising fibers in which the fiber lumps comprise at least two kinds of fibers, one of constituent fibers contains an ingredient having a melting point lower than that of other fibers, the fiber lumps are substantially bonded at portions of contact between each of the fibers with the low melting ingredient and the fibers constituting the fiber lump are arranged along random directions in at least two surfaces of the fiber lump.

10. A non-woven fabric structure produced by preliminarily opening fibers by a preliminary fiber opening, then accumulating fibers so as to automatically stack them vertically to a portion of low accumulation level by using an air stream, then applying primary heat fusion by a heat fusing treatment to form a non-woven fabric, forming the non-woven fabric into fiber lumps at least smaller than the non-woven fabric, forming the fiber lumps into a desired shape and then applying secondary heat fusion by a heat fusing treatment.

11. A non-woven fabric of a three dimensional structure comprising fibers, which is bonded substantially at portions of contact between each of the fibers and in which the three dimensional structure contains fibers coated with a silicon oil agent and the fibers are arranged along random directions in at least two surfaces of the three dimensional structure.

12. A non-woven fabric of a three dimensional structure

comprising at least two kinds of fibers, in which one of the constituent fibers contains an ingredient having a lower melting point than that of other fibers, at least one of the fibers other than the fibers containing the low melting ingredient is coated with a silicon oil agent, they are substantially bonded at portions of contact between each of the fibers with the low melting ingredient, and the fibers are arranged along random directions at least in two surfaces of the three dimensional structural.

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FEB 11 1964
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